

Quarterly Progress Report

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Near-Term Objectives

1) Prepare Algorithm Theoretical Basis Document 2) Hire Information Management specialist 3) Deploy ocean color buoys in California Current 4) Develop ocean color white paper in the context of the planned 20-year time series of ocean color measurements 5) Attend EOSDIS Core System (ECS) System Requirements Review

Task Progress

1) Algorithm Theoretical Basis Document

As part of the Data Products for EOS, algorithm developers are required to produce a report documenting the scientific basis of each product. The ATBD will document the ancillary data that are required for each product as well as an estimate of the errors. I am responsible for ATBD's for the chlorophyll fluorescence data product (fluorescence line height and fluorescence efficiency) and for primary productivity (near-surface productivity).

I have completed a thorough literature survey on these topics with a graduate student, Steven Seibel. We have a rough draft for the ATBD's and will turn these documents into the project shortly.

2) Information Systems Developer

I hired Roen Hogg, who previously worked at the Advanced Technology Group with American Express. His first task was to define the data flows within our research group. The intent is to build an information management system that would not only track data through all of the stages of processing, analysis, and modeling, but would develop an object-oriented approach to provide a consistent environment across all of these

tasks. We are using ONR's Eastern Boundary Current study as a prototype as it contains field (ships, drifters, and moorings) and satellite data as well as ocean modeling. He has defined the persistent classes in an object-oriented framework. He is now beginning to map this OO architecture onto our hardware architecture.

3) Ocean Color Buoys

Since early May, I have deployed 15 ocean color drifters in the California Current. Each drifter is equipped with a spectroradiometer measuring upwelled radiance at the SeaWiFS wavelengths as well as sun-stimulated fluorescence. Four drifters failed early in the deployment, in part because of rough seas. Five drifters are continuing to relay data back via Service Argos. The average lifetime has been 2 months, a bit shorter than expected. However, the optical data seems to be fine, with no evidence of fouling. The relationship of fluorescence to chlorophyll biomass (as estimated from the blue/green ratio) is quite complex, as expected. We are continuing data analysis and expect to deploy 10 more drifters in the next 6 months.

4) Ocean Color White Paper

The ocean color science community is strongly supportive of the goal of a 20-year time series of 1 km resolution ocean color data collected on a global basis. There is concern that this goal will be difficult to achieve given our dependence on an array of foreign and U.S. sensors. Although the technical problems are challenging, more concern was expressed about the managerial/political problems. A draft was circulated to the U.S. SeaWiFS science team and the MODIS Oceans team. So far, only 8 people have responded.

5) EOSDIS Core System

In advance of the ECS Systems Requirements Review, I read the Specifications Requirements and Operations Concepts documents provided by the project. I attended the review at GSFC and delivered 45 RID's to the ESDIS Project.

Anticipated Activities

1) Analysis of Drifter Data

We will continue analysis of the ocean drifters. We will pay particular attention to issues of fouling and calibration, and to the relationship of fluorescence to chlorophyll concentration and physical processes. This will be the main focus of my research for MODIS.

2) ATBD

I will complete my ATBD's in the next month. I expect that the ATBD's will continue to be revised as new information becomes available.

3) Algorithm Development

I am starting the hiring process for a postdoctoral researcher who will focus on primary productivity algorithms. This researcher will make use of laboratory and field measurements of sun-stimulated fluorescence to determine its relationship to physical and biological processes.

4) ECS

I expect to continue reviewing ECS plans and documentation.

5) Science Compute Facilities

We expect to begin testing advanced networking with Otis Brown (U. Miami) using support from the Naval Research Laboratory. Complete testing will start in early 1994.

6) Information Management

We will continue our object-oriented data management work. We are investigating various OO products from different vendors. We will begin actual prototyping in early 1994.

Problems/Corrective Actions

No significant problems were encountered.